



Test Monitoring Center

@ Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

<http://astmtmc.cmu.edu>
412-365-1000

MEMORANDUM: 18-006

DATE: April 24, 2018

TO: Kristijan Drlja, Chairman, L-60-1 Surveillance Panel

FROM: Dylan Beck *Dylan Beck*

SUBJECT: L-60-1 Reference Oil Testing from October 1, 2017 through March 31, 2018

Attached is a summary of testing activity this period.

DJB/djb/mem18-006.djb.doc

cc: Frank Farber

Jeff Clark

Scott Parke

L-60-1 Surveillance Panel

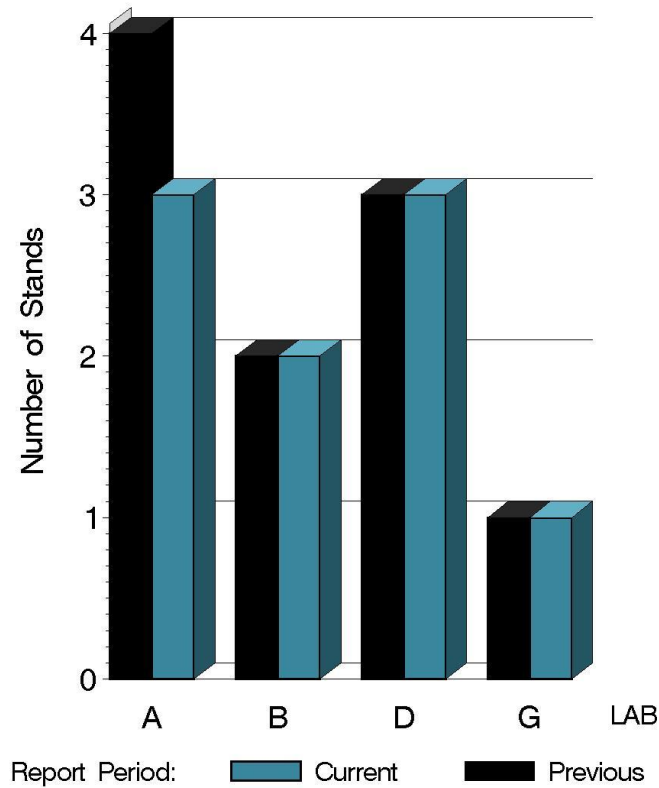
<http://www.astmtmc.cmu.edu/ftp/docs/gear/1601/semiannualreports/1601-04-2018.pdf>

Distribution: email

L-60-1 (D5704)

	Reporting Data	Calibrated on 3-31-18
Number of Labs	4	4
Number of Stands	9	9

BY-LAB STAND
DISTRIBUTION



15:48:03 12APR2018

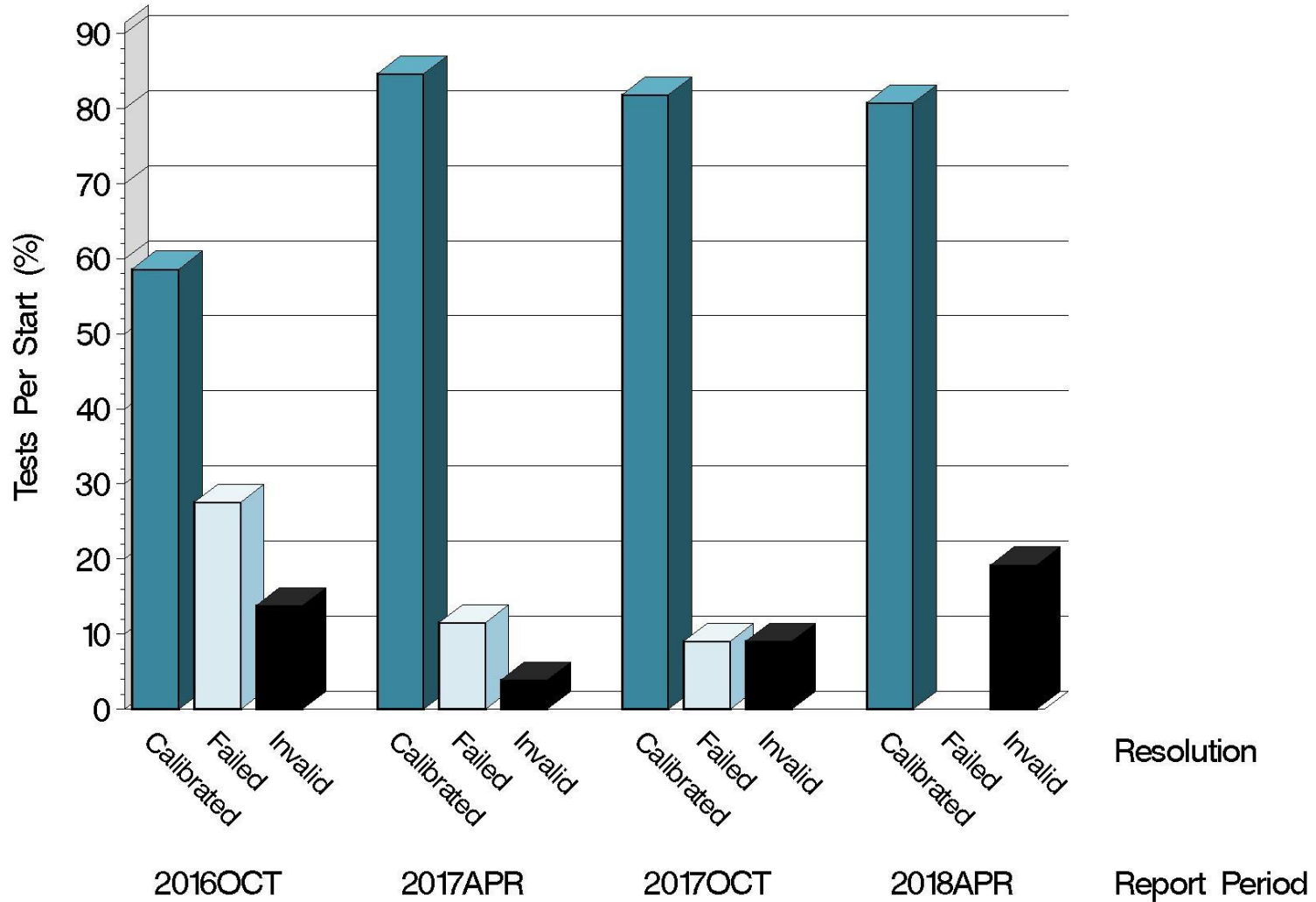
L-60-1 (D5704)

Test Distribution by Oil and Validity

				Totals	
		148-1	155-1	Last Period	This Period
Accepted for calibration	AC	9	12	18	21
Rejected (Mild)	OC	0	0	0	0
Rejected (Severe)	OC	0	0	2	0
Rejected (Combination)	OC	0	0	0	0
Rejected (Precision)	OC	0	0	0	0
Invalidated calibration	LC	3	1	0	4
Acceptable info run	NI	0	0	1	0
Unacceptable info run	MI	0	0	0	0
Aborted	XC	0	1	2	1
Total		12	14	23	26

L-60-1 (D5704)

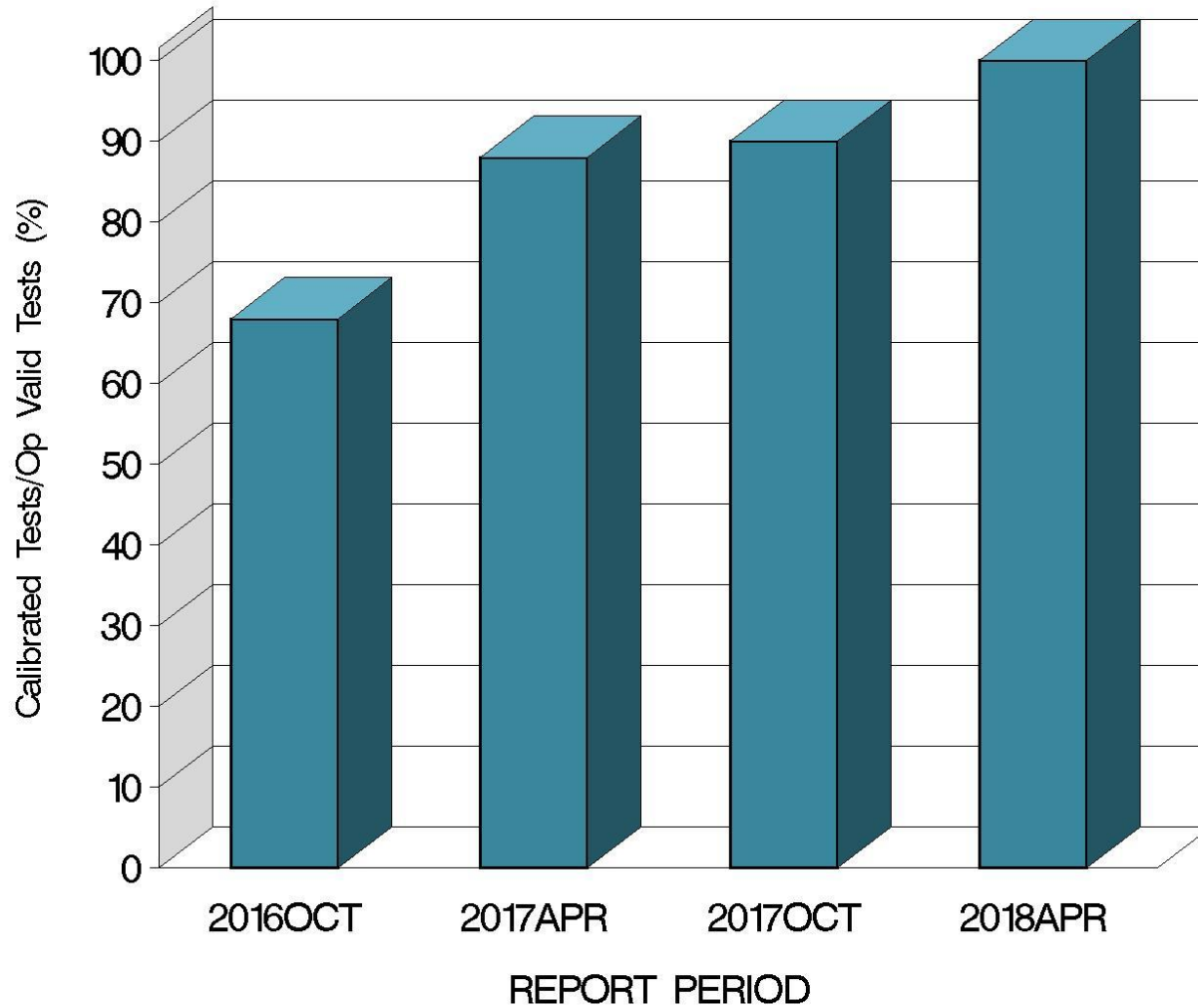
CALIBRATION ATTEMPT SUMMARY



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L-60-1 (D5704)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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L-60-1 (D5704)

CAUSES FOR LOST TESTS

		Oil		Validity			Loss Rate		
Lab	Cause	148-1	155-1	RC	LC	XC	Lost	Starts	%
A	No Instrument Air	●			●		4	11	36%
B	Ground Wire Failure		●			●	1	7	14%
Lost		3	2	0	4	1			
Starts		12	14	26	26	26			
%		0.25%	14%	0%	15%	3.8%			

L-60-1 (D5704)

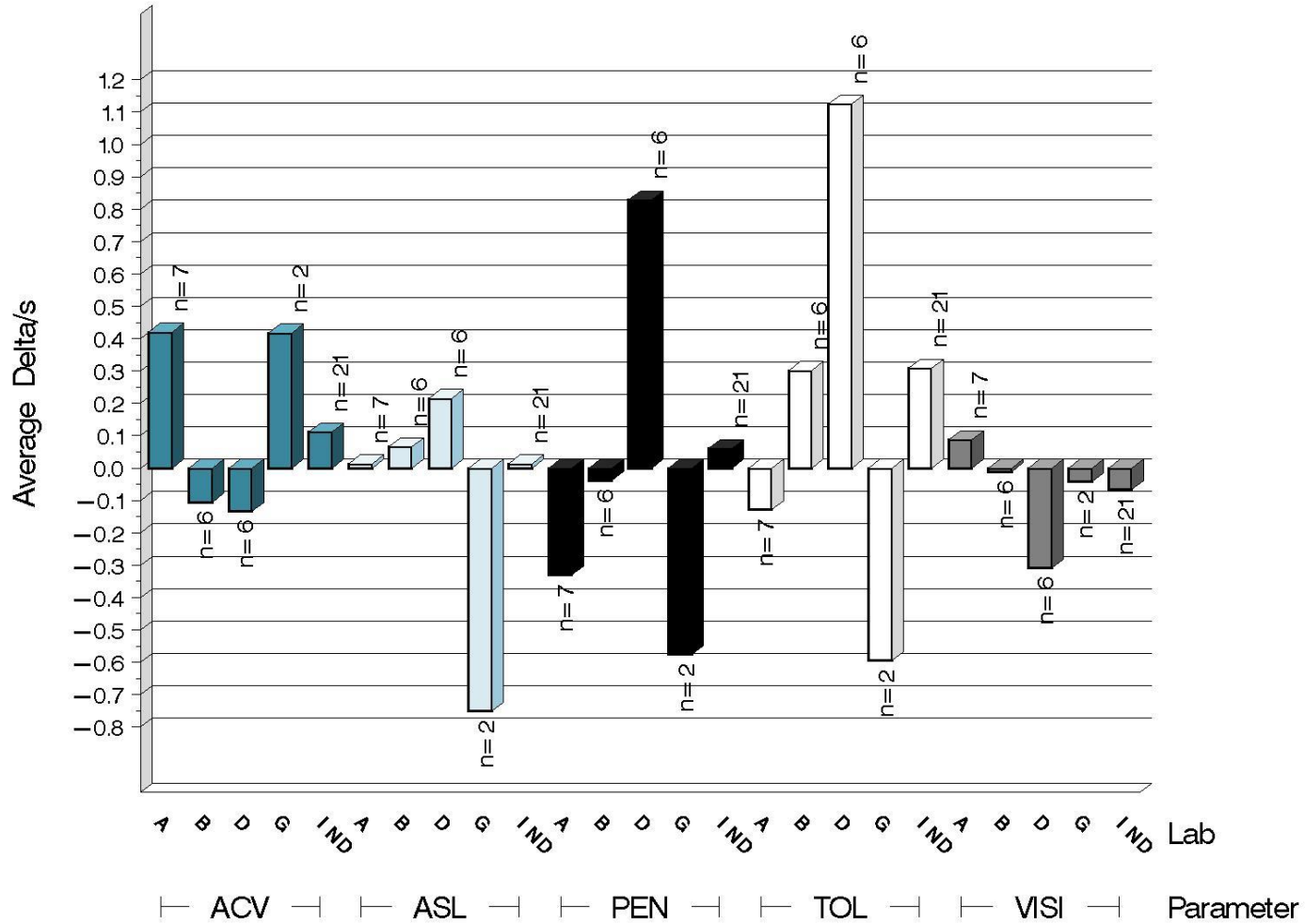
Average Δ /s by Lab						
Lab	n	VISI	PEN	TOL	ACV	ASL
A	6	0.087	-0.331	-0.128	0.420	0.013
B	6	-0.011	-0.038	0.302	-0.106	0.066
D	6	-0.308	0.829	1.125	-0.134	0.215
G	2	-0.041	-0.576	-0.595	0.417	-0.751
Industry	21	-0.066	0.061	0.308	0.111	0.013
Shift*	21	-0.51%	0.02%	0.08%	-0.06 merit	0.00 merit

*computed using severity adjustment standard deviation. A correction factor was implemented for ACV on October 1, 2015 that is intended to return industry ACV performance to the level originally seen in the test.

L-60-1 (D5704)

TEST SEVERITY

DELTA/S BY LAB

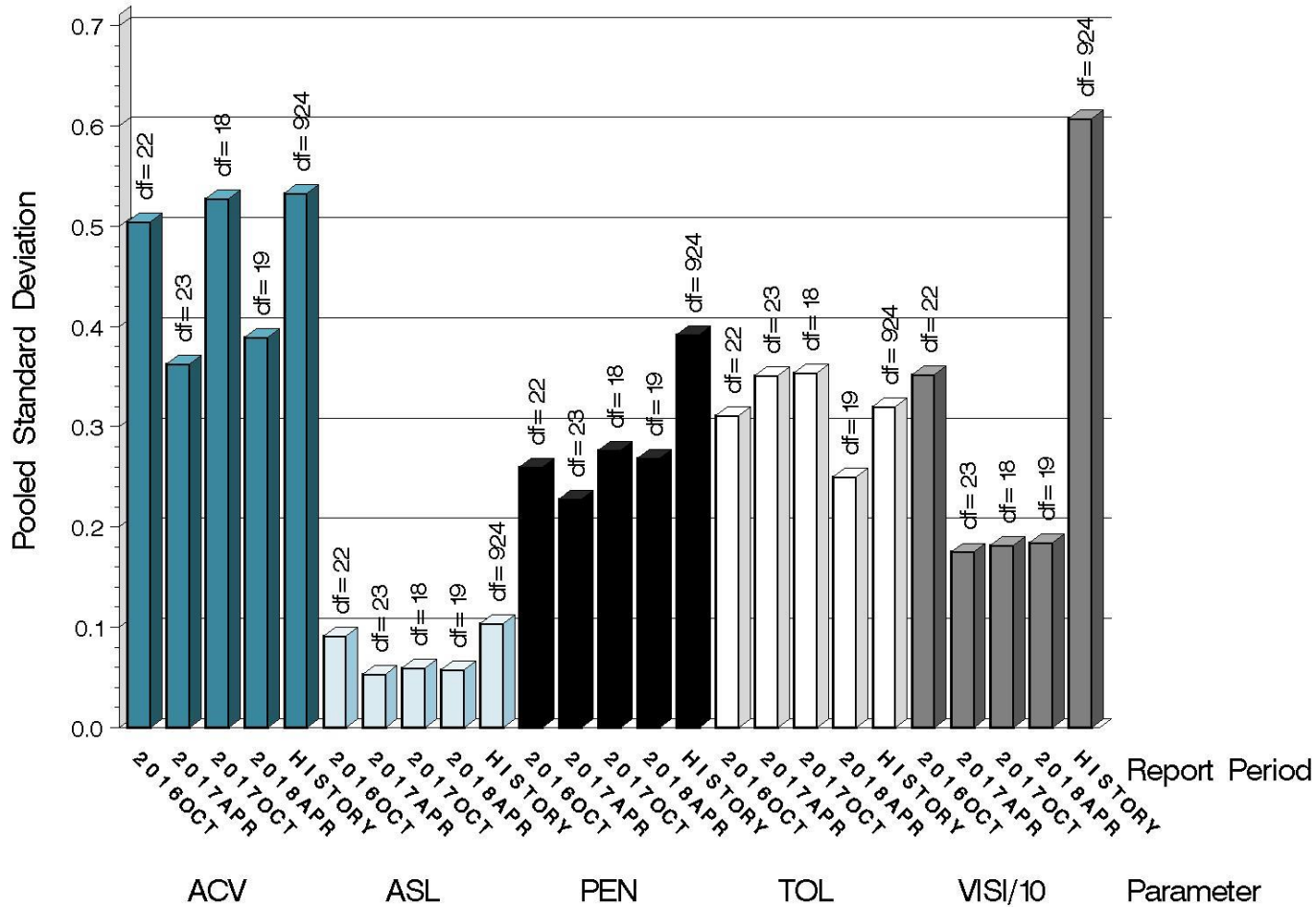


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L-60-1 (D5704)

TEST PRECISION

POOLED STANDARD DEVIATION
BY SIX-MONTH ASTM REPORT PERIOD



due to the vastly larger reported results for VISI in relation to the other parameters, it is shown scaled by 0.1

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L-60-1 (D5704)

SUMMARY OF SEVERITY & PRECISION

Severity

The Surveillance Panel implemented a correction factor for ACV on October 1, 2015 intended to return ACV to target. ACV has remained within limits this period. Severity for all parameters remained within limits this period.

Precision

Precision for all parameters remained within limits this period.

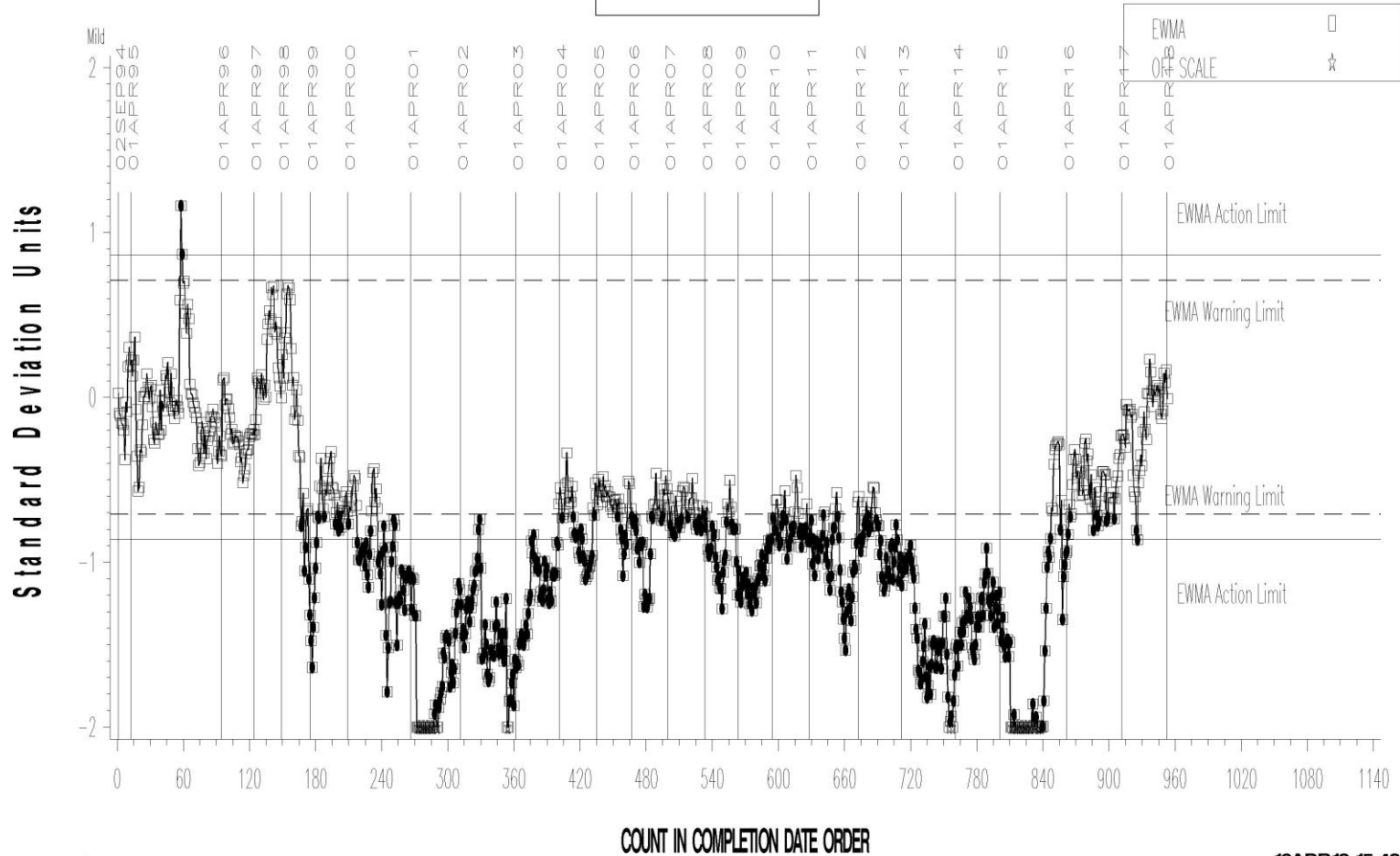
Industry control charts follow.

L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Severity Analysis



SPURP

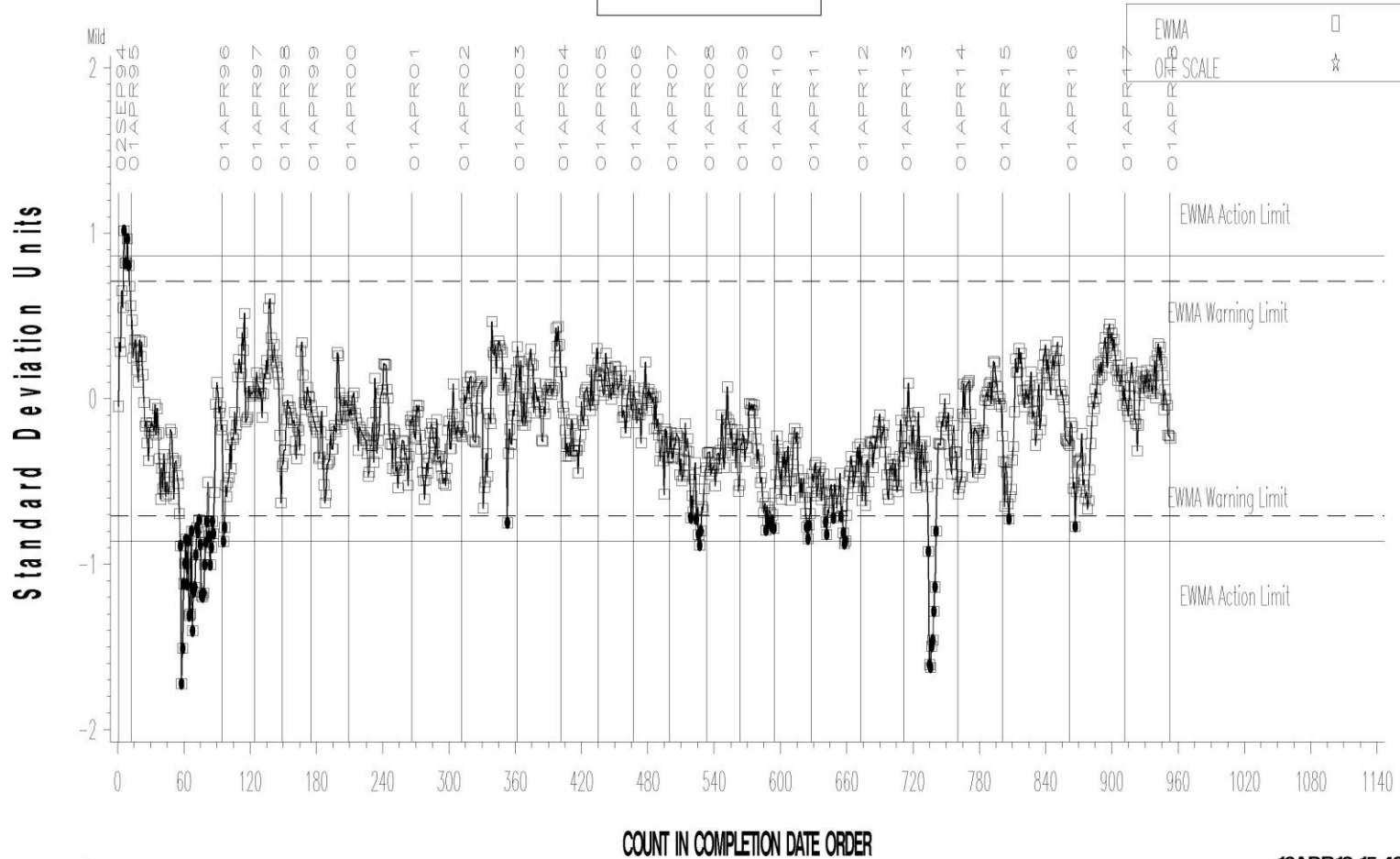
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Severity Analysis



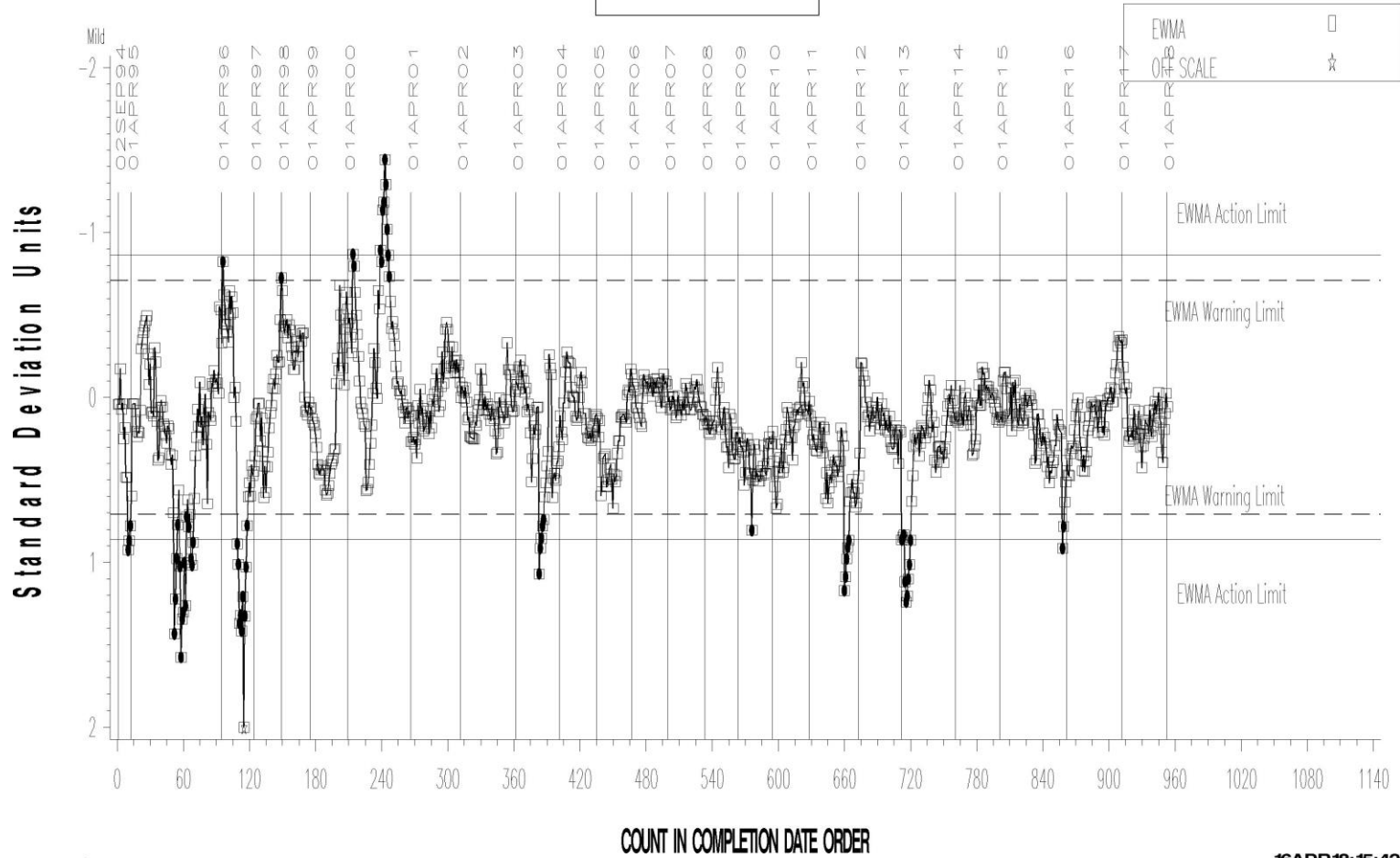
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Severity Analysis



SPURP

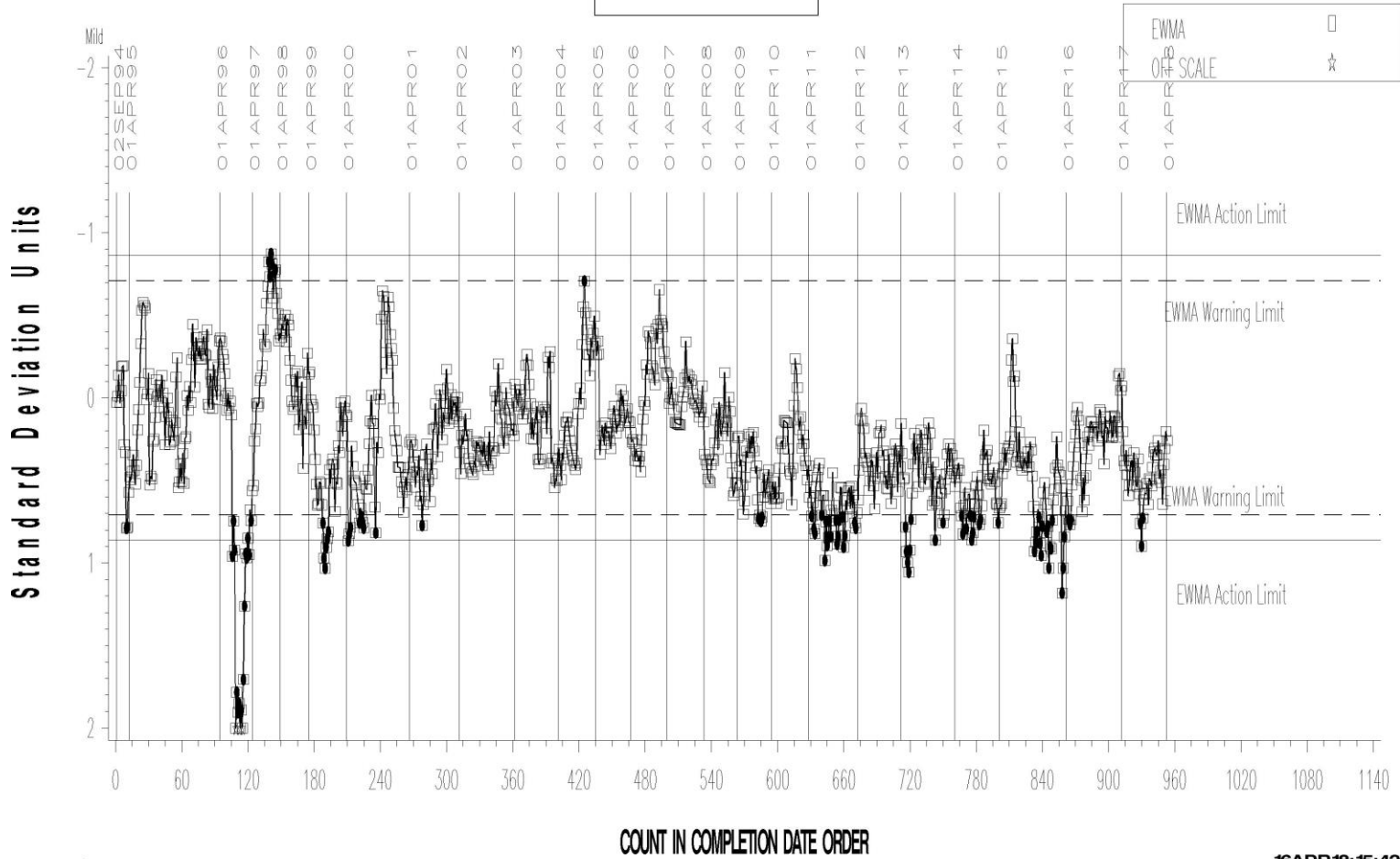
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Severity Analysis



SPURP

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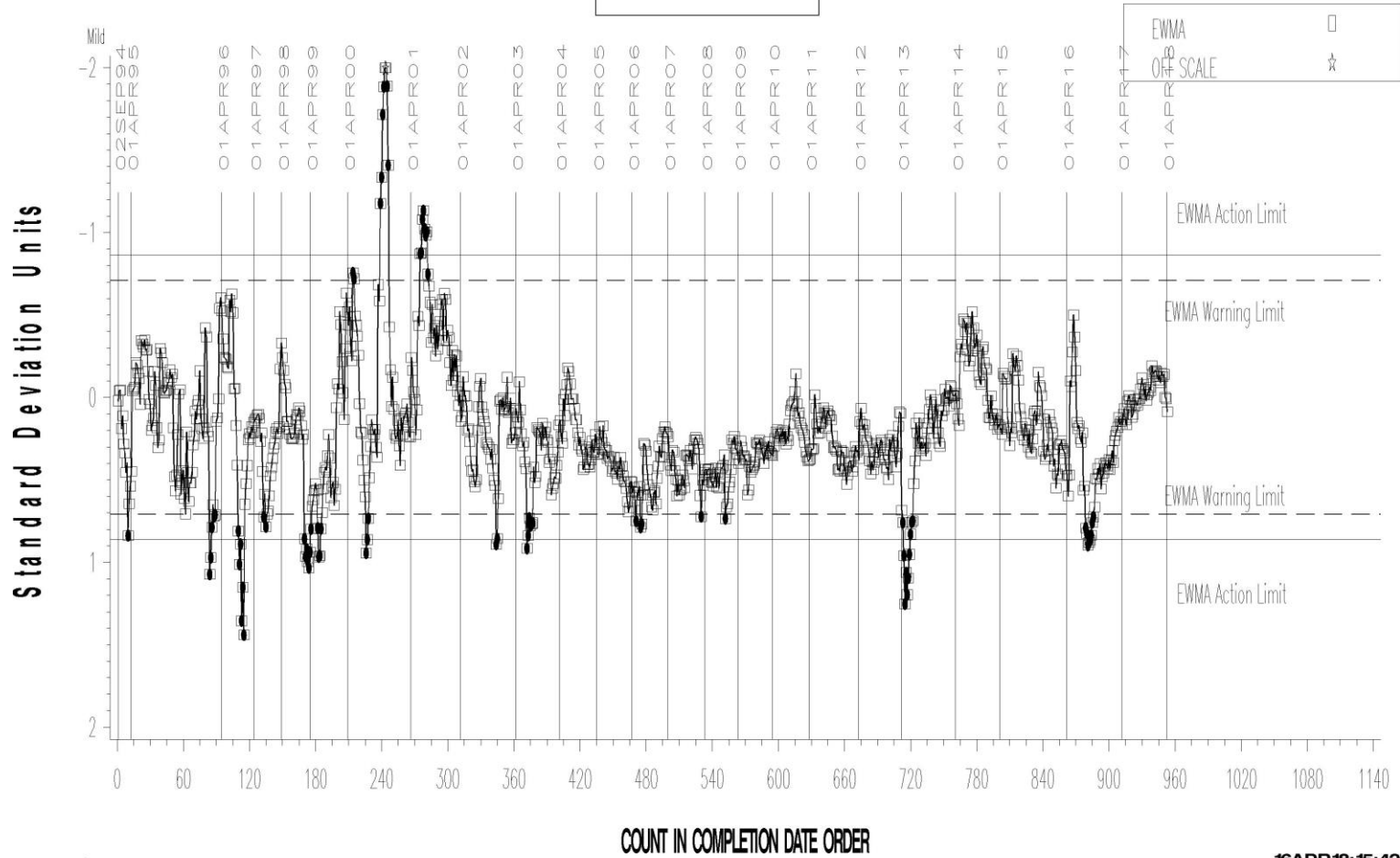
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Severity Analysis



SPURP

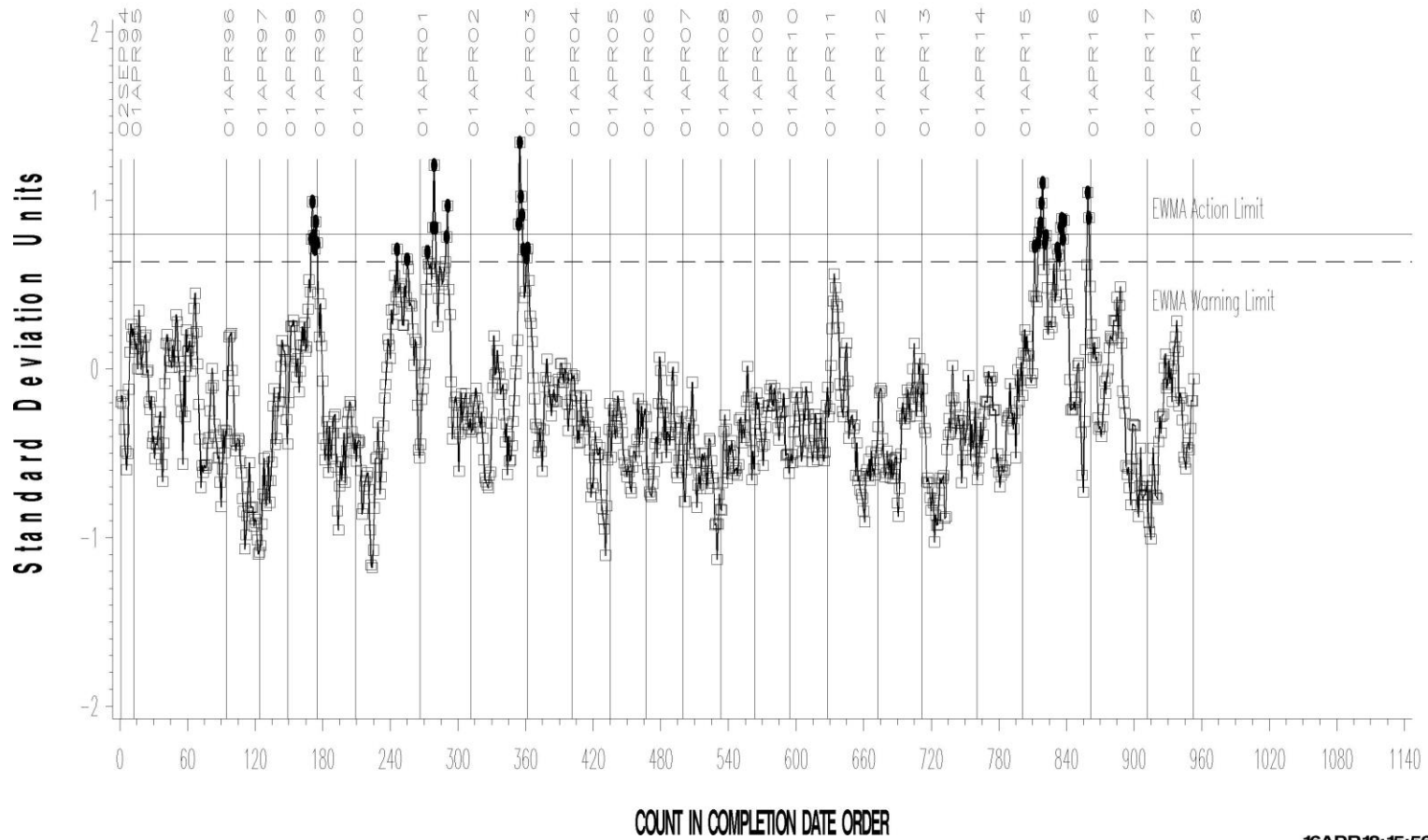
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

LTMS Precision Analysis



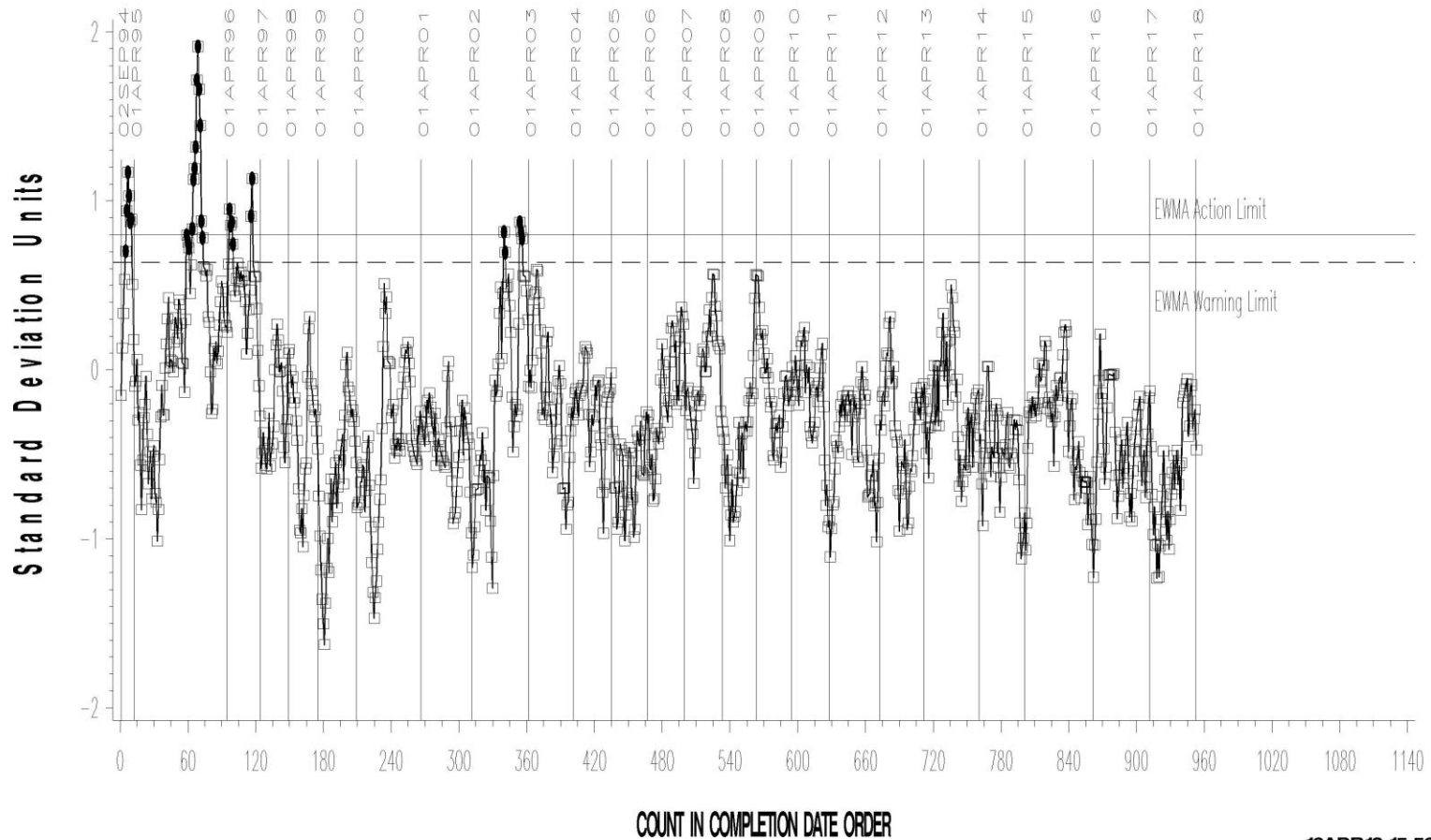
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

LTMS Precision Analysis



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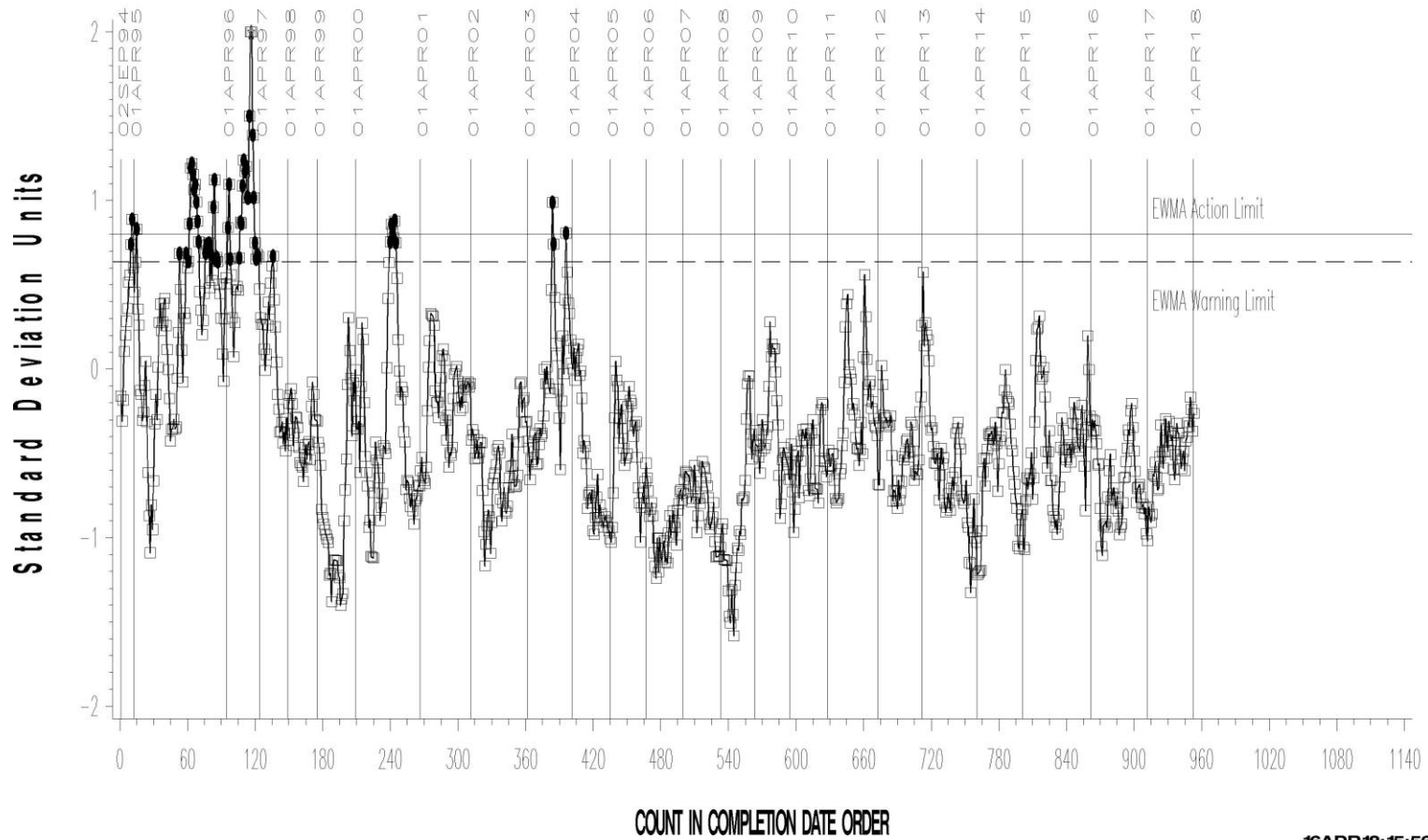


L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

LTMS Precision Analysis



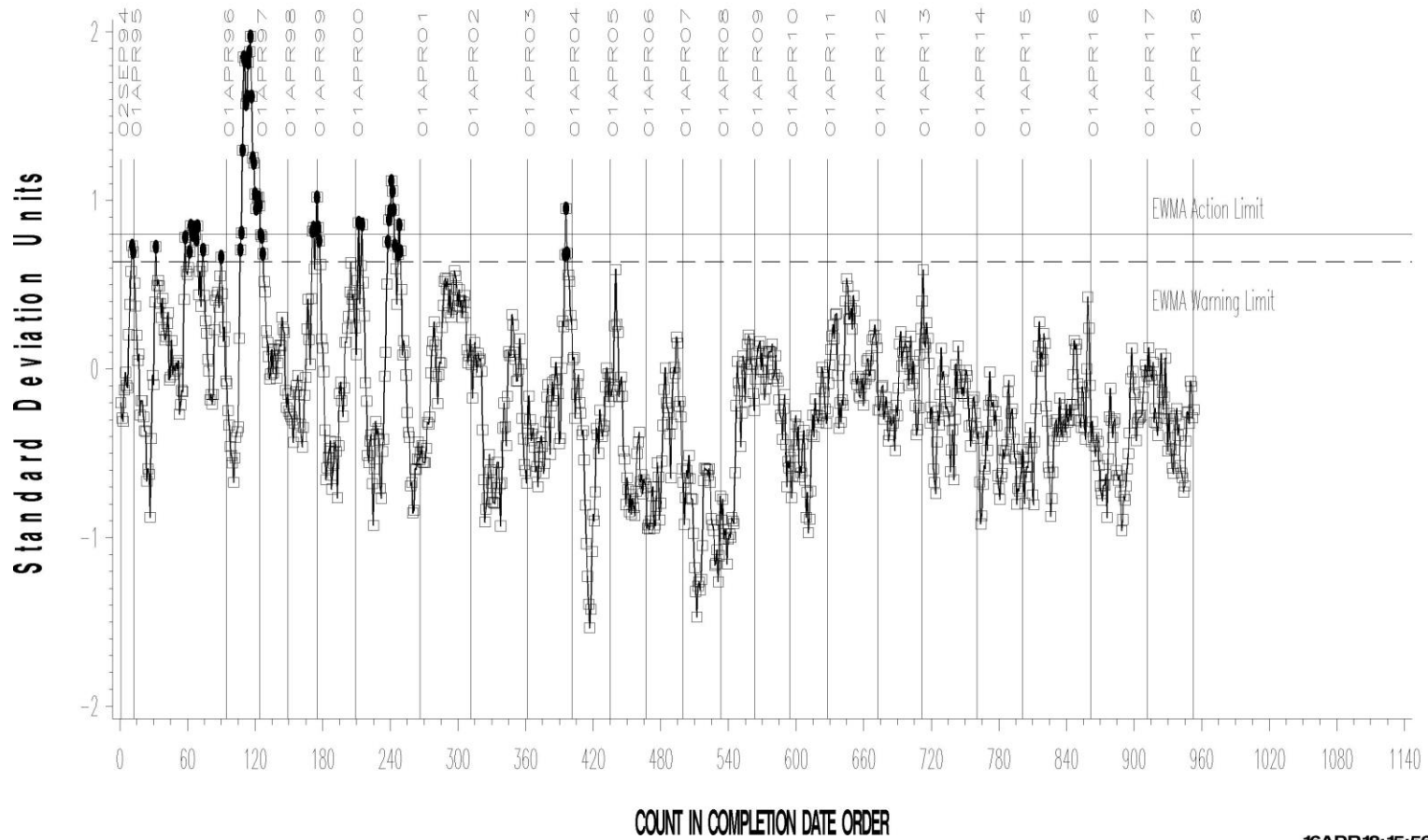
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

LTMS Precision Analysis



16APR18: 15:56

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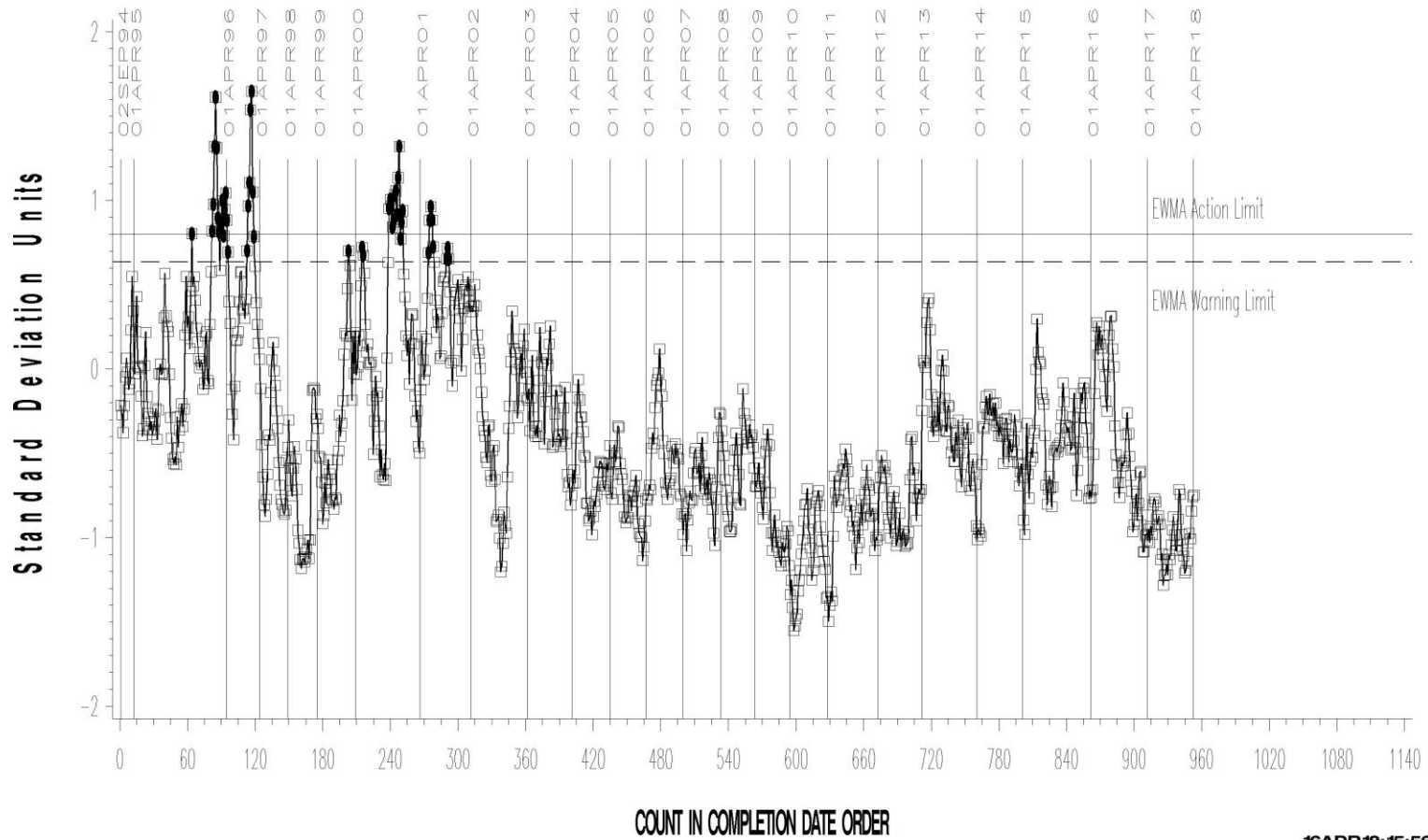
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

LTMS Precision Analysis



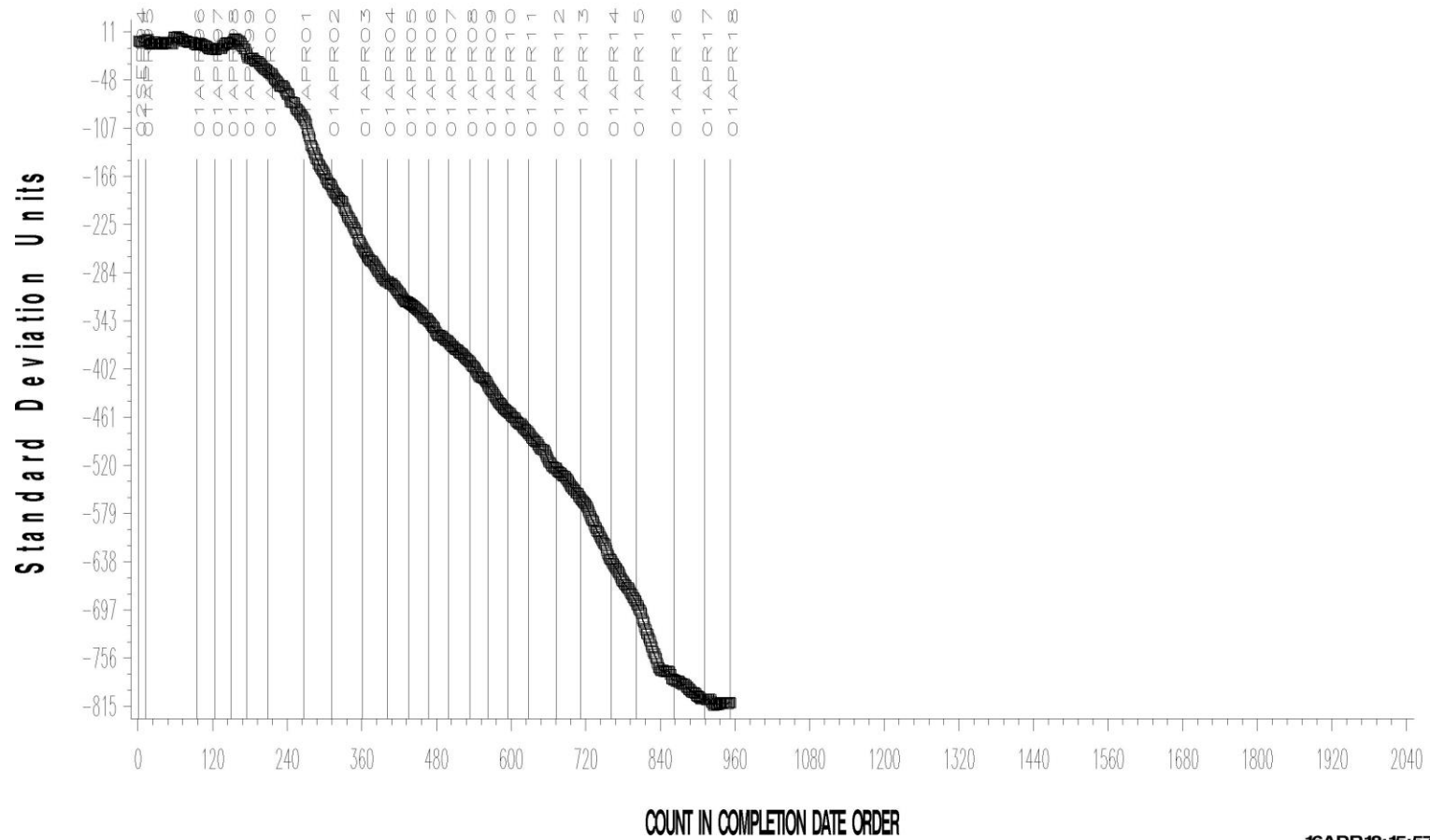
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

CUSUM Severity Analysis



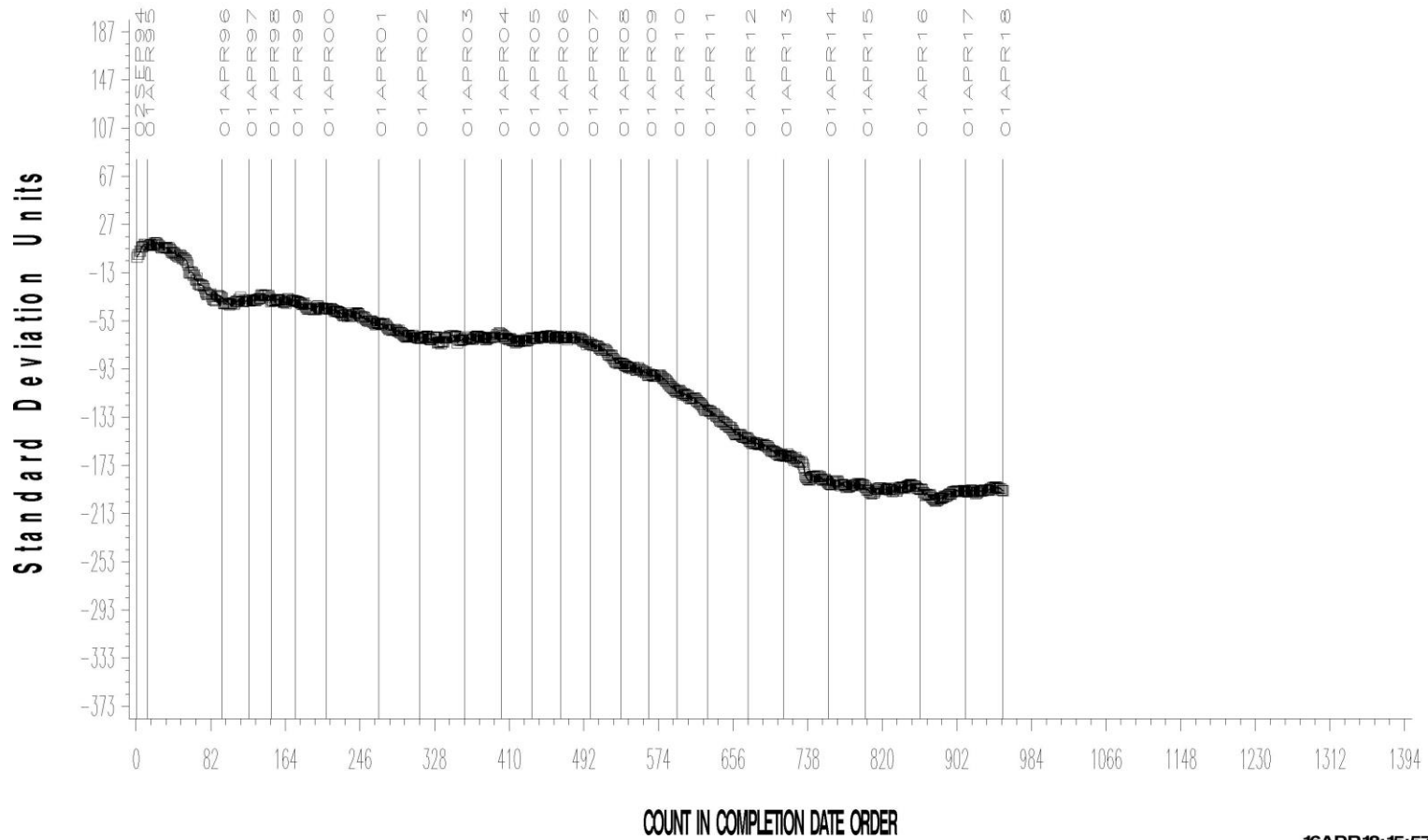
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE SLUDGE

CUSUM Severity Analysis



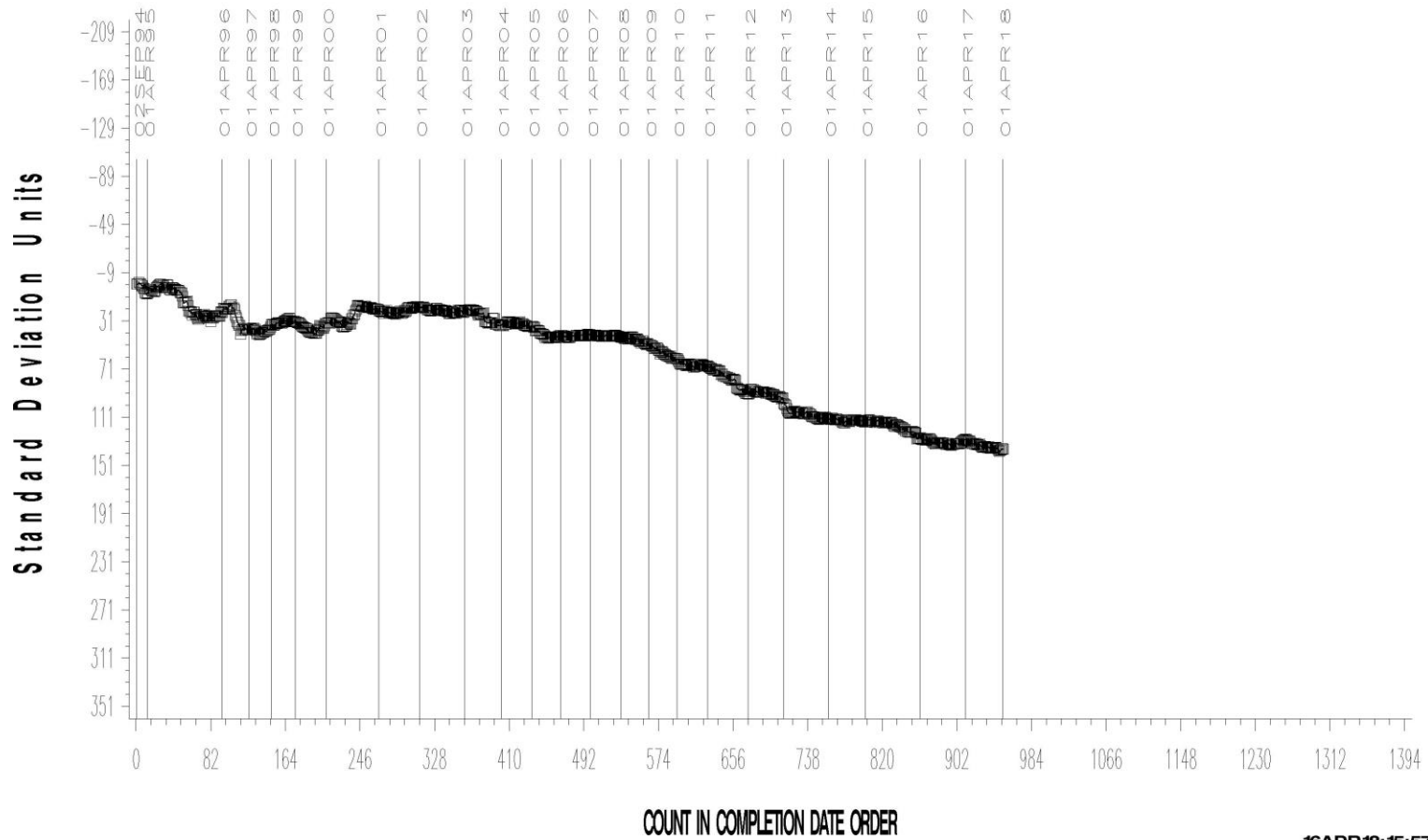
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

CUSUM Severity Analysis



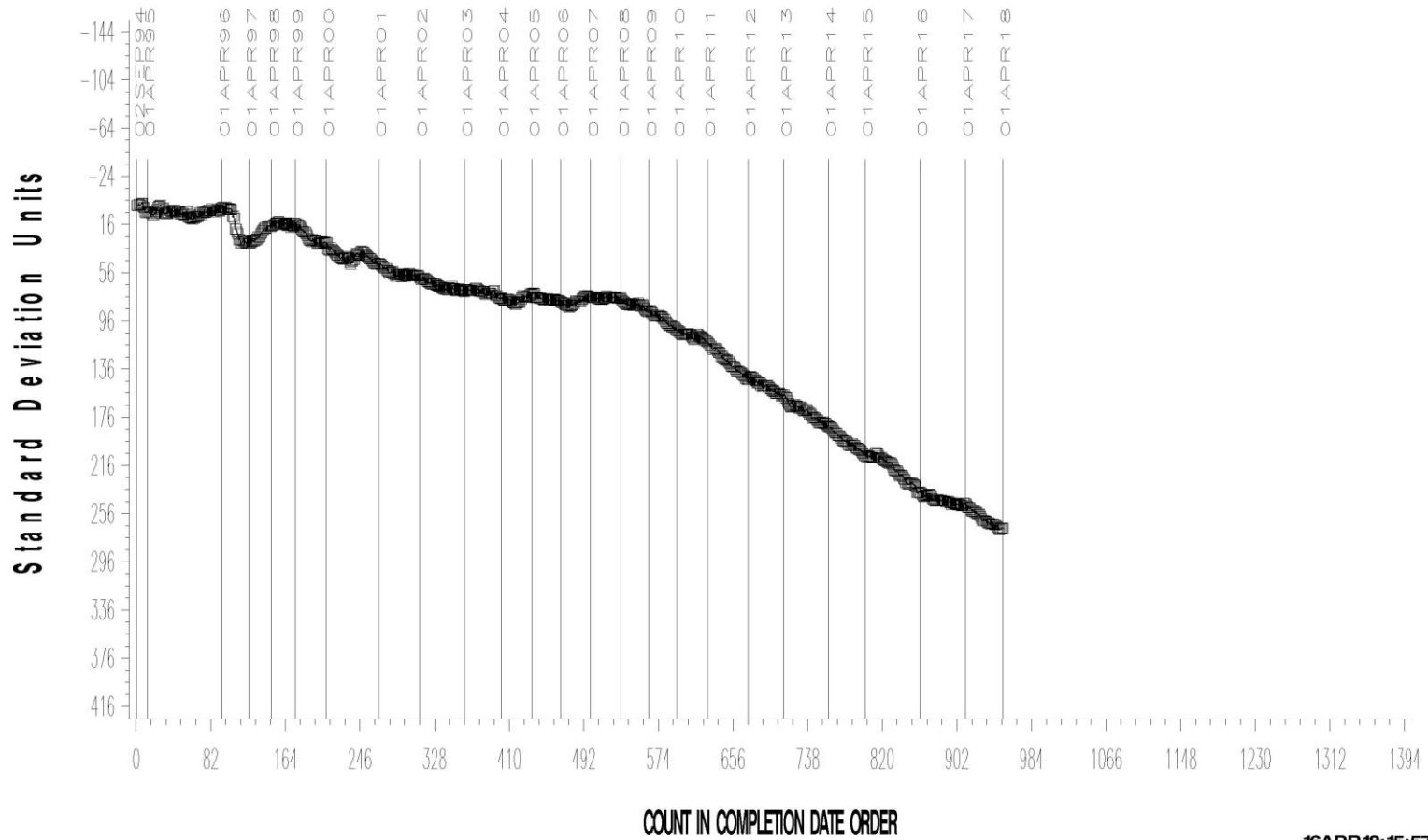
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

CUSUM Severity Analysis



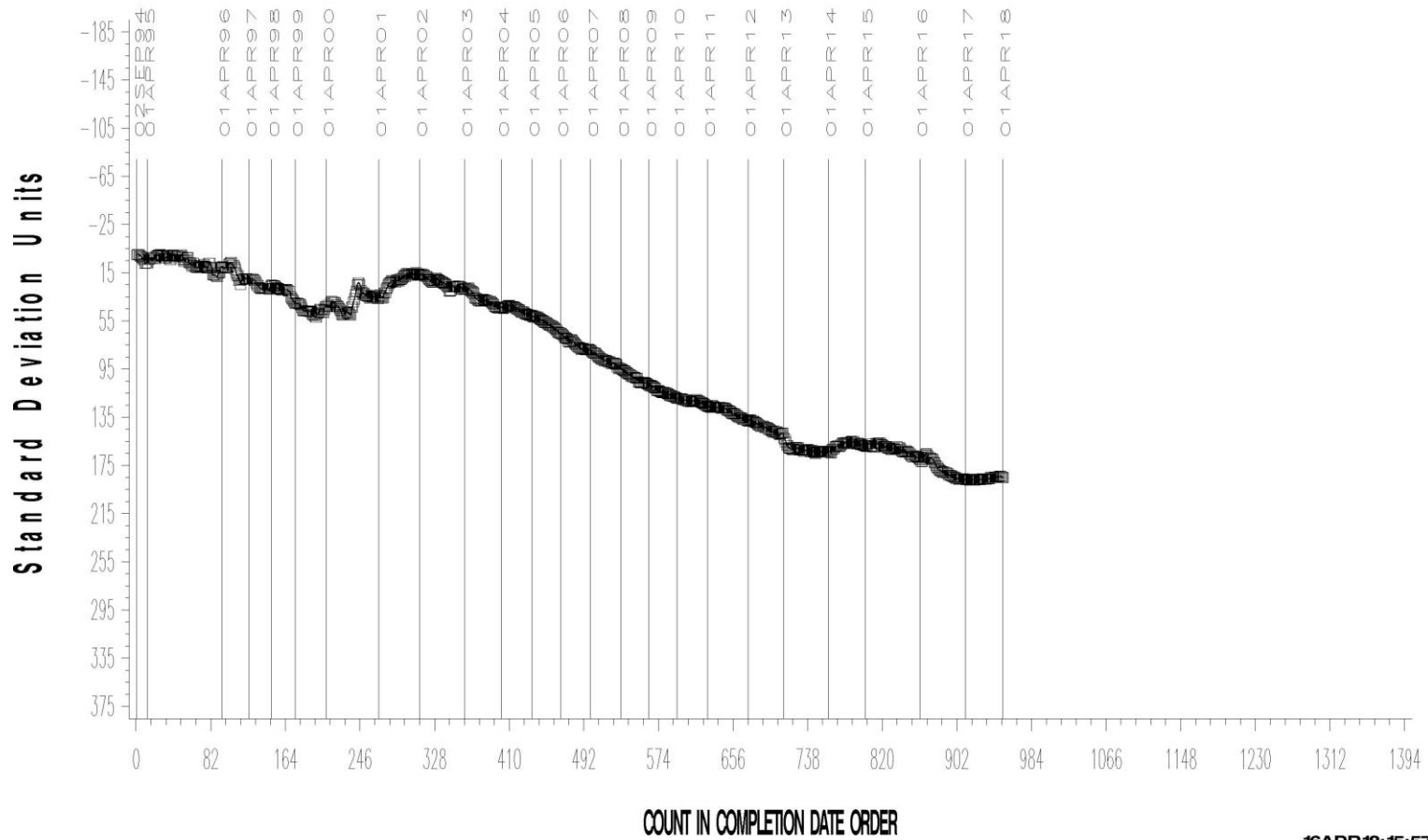
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L-60-1 (D5704)

L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL VISCOSITY INCREASE

CUSUM Severity Analysis



16APR18: 15:57

L-60-1 (D5704)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
		No timeline additions were made this period.

L-60-1 (D5704)

LAB VISITS

One L-60-1 lab visit was conducted this period. All of the aspects of test conduct examined were found to be in compliance with the documented test procedures.

INFORMATION LETTERS

No information letters were issued this period.

L-60-1 (D5704)

STATUS OF REFERENCE OIL SUPPLY

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
148-1	16	401	25.1
155-1	19	603	37.7
Total	35	1004	62.8

The surveillance panel has asked that the TMC reserve a portion of oil 155-1 for L-60-1 testing. The TMC quantity shown for this oil is for that reserved portion. A separate quantity of 186 gallons is available for use in other gear testing. Four hundred and one tests of oil 148-1 remain in TMC inventory; however, this is only 25 gallons. When the need arises, it will not be possible to obtain a reblend of this oil. The panel is advised to begin considering a possible replacement for this oil.